

Factor analysis and Mokken scaling of the Organisational Commitment Questionnaire in nurses

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Abstract

Aims

To generate an Arabic version of the Organisational Commitment Questionnaire that would be easily understood by Arabic speakers and would be sensitive to Arabic culture.

Background

The nursing workforce in Saudi Arabia is undergoing a process of Saudization but there is a need to understand the factors that will help to retain this workforce.

Introduction

No organizational commitment tools exist in Arabic that are specifically designed for health organizations. An Arabic version of the organizational commitment tool could aid Arabic speaking employers to understand their employees' perceptions of their organizations.

Methods

Translation and back-translation followed by factor analysis (principal components analysis and confirmatory factor analysis) to test the factorial validity and item response theory (Mokken scaling).

Results

A two-factor structure was obtained for the Organizational Commitment Questionnaire comprising Factor 1: Value commitment; and Factor 2: Commitment to stay with acceptable reliability measured by internal consistency. A Mokken scale was obtained including items from both factors showing a hierarchy of items running from commitment to the organization and commitment to self.

Discussion

The present study shows that the Arabic version of the OCQ retained the established two-factor structure of the original English-language version. Although the two factors – “value commitment” and “commitment to stay” – repudiate the original developers’ single factor claim.

Conclusion

A useful insight into the structure of the Organizational Commitment Questionnaire has been obtained with the novel addition of a hierarchical scale.

Implications for nursing policy

The Organizational Commitment Questionnaire is now ready to be used with nurses in the Arab speaking world and could be used a tool to measure the contemporary commitment of nursing employees and in future interventions aimed at increasing commitment and retention of valuable nursing staff.

Key words: organization, management, commitment, nurses, Arabic, psychometrics, Saudi Arabia, workforce

A multivariate analysis of organizational commitment among nurses

Introduction

Currently, no organizational commitment tools have been developed in the Arabic language that are specifically designed for health organizations. The generation of an Arabic version of the organizational commitment tool could aid Arabic speaking employers to assess and understand better their employees' perceptions of their organizations with a view to enhancing organizational commitment, increased job satisfaction (Alghamdi & Urdenb 2016, Alghamdi, et al. 2017, Alotaibi et al. 2016), motivation, performance (Collini, et al. 2015) and retention (Aboshaiqah 2016). The aim of this study was to generate an Arabic version of the Organisational Commitment Questionnaire (OCQ) that would be easily understood by Arabic speakers, would be sensitive to Arabic culture and which could be used across the Arabic speaking world.

Background

Organizational commitment is a well-documented concept in the management and organizational behavior literature (Commeiras & Fournier 2001, Dale 2008, Mowday et al. 1979; Porter et al. 1974). Recent studies in this field are based on the valuable information it provides about employee retention and employees' behaviors, job satisfaction and job performance (Holtom & O'Neill 2004, Kuokkanen et al. 2003, Lynn & Redman 2005). Studies have largely used the Organizational Commitment Questionnaire (OCQ) as a measure: this is a 15-item self-report questionnaire that assesses employee's commitment to their organization (Mowday et al. 1979). However, despite its widespread use, the OCQ appears to have unstable factor dimensionality (Bozeman & Perrewe 2001). Moreover, organizational commitment is a Western construct, so the degree to which it may be

generalized to non-Western cultures has been subject to some debate; evidence suggests organizational commitment differs greatly between cultures (Al-Kahtani 2012, Ibrahima & Rueb, 1994). Given the rapidly changing political and economic environment in the Arab region, research on whether the OCQ is generalizable to non-Western samples is timely.

Although the OCQ has been widely validated and used in different cultures, such as Korea (Han et al. 2009), Singapore (Loke 2001), and China (Lu et al. 2007), there is currently no evaluated Arabic version. Evidence supports the use of translated survey instruments when sufficient attention is paid to determining the equivalence of concepts, such as culturally-specific expressions, between the primary and secondary language (Cha et al. 2007). The World Health Organization has emphasized that the translated version of any instrument must perform in virtually the same way as it does in its original setting and that it should be acceptable and equally natural to the study population (WHO 2011).

Early researchers of organizational commitment claimed that the concept was multidimensional and had multiple definitions. Porter et al. (1974), for instance, say organizational commitment could be defined as how strong an individual's identification with, and engagement in, an organization is. Organizational commitment is characterized by three factors: (1) a strong belief in, and acceptance of, the organization's goals and values; (2) a readiness to exert effort serving the organization; and (3) strongly desiring to remain with the current organization (Mowday et al. 1979). Where these factors are present, employees hope to be active within their organization; influence what is happening in it; feel that their status is high within it; and are willing to exceed expectations of them. Arising from this definition and conceptualization, Porter et al. developed the measure of organizational commitment known as the

OCQ (Mowday et al. 1979). Mowday et al. (1979) extended the concept to include another construct, “job satisfaction”, and, by doing so, showed that organizational commitment can predict turnover better than job satisfaction alone.

The OCQ is widely used to measure organizational commitment (Wagner 2007). It was developed to measure the degree of commitment members of staff have towards their organization, as demonstrated by the employee’s readiness to “give back” to the organization (Mowday et al. 1979). The OCQ is a 15-item measure with a seven-point Likert scale, ranging from “strongly disagree” to “strongly agree” (whereby a high score indicates greater organizational commitment), with 6 of the 15 items reverse scored. It has been shown to be a reliable and valid instrument demonstrating good internal consistency, reliability, test-retest reliability, convergent validity, discriminant validity and predictive validity; its internal consistency usually ranges from 0.82 to 0.93 (Mowday et al. 1979). No permission is required to use the OCQ as the original author decided against copyrighting the instrument to encourage its use by others.

There has been a longstanding debate in the literature as to whether the OCQ provides multidimensional or unidimensional measurement. In contrast to Porter et al.’s (1974) original definition that included three distinct dimensions, Mowday et al. (1997) found that the fifteen-item OCQ returned a single factor; indicating measurement of just one dimension. Angle and Perry (1981) suggested a two-factor structure: “value commitment” and “commitment to stay”, a finding that was replicated in later studies, which further attests to the multidimensionality of the OCQ (Akhtar & Tan 1994, Tett & Meyer 1993). Recent investigations by Fields (2002) and Manion (2004) have further revealed three different dimensions: “affective”, “normative” and ‘continuance commitment’.

Yet, Commeiras and Fournier (2001), who conducted a confirmatory factor analysis to test the structure of the OCQ, supported its unidimensional structure and also claimed that the factor structure of the OCQ is not stable.

Aim of the study

To translate the OCQ for use in Arabic speaking populations, and to investigate the factor structure and scaling properties of the translated instrument.

Methods

Design

This was a methodological study conducted within the conceptual framework of the Full Range of Leadership (FRL) Model.

Sample and setting

The two largest Ministry of Health hospitals in Riyadh, Saudi Arabia were the study sites. Both these settings provide a full range of medical and nursing services while one is private and one is run by the Ministry of Health. These sites were chosen for the purposes of the main study (Alyami2013) which was investigating potential differences between these two types of setting. The total number of staff in these sites is 4,858. One sample from each hospital was recruited and the sample size was dictated by a power analysis for the main study (Alyami 2013), of which this study was a part, and which is adequate for the present factor analysis where the ratio of respondents to items in the questionnaire should be at least 10:1 (Watson & Thompson 2006). The final sample was 412.

Data collection

Translation of the OCQ

We used Brislin's back-translation model to translate the OCQ from English to Arabic. The model involves: 1) back-translation; 2) bilingual technique; 3) committee approach; and 4) pre-test procedure (Brislin 1970). In accordance with the Brislin model, the process undertaken for the present study was as follows:

- 1) A group discussion was arranged with bilingual PhD candidates from various subject areas including nursing to ensure the cultural sensitivity of the questionnaire and its content equivalence.
- 2) The questionnaire was translated into Arabic by a group of researchers (thereby adhering to the committee approach) who were fluent in both Arabic and English to retain the meaning of the English questionnaire whilst ensuring its cultural acceptability for the Saudi context, rather than simply using the same precise language (WHO 2011).
- 3) Any challenges arising during this phase, such as problematic phrases or words, were brought to a group discussion. We followed the work of Al-Muhtaseb and Mellish (2008) to produce the Arabic text.
- 4) Once above was done, a professional translator and one healthcare professional reviewed the questionnaire for cultural appropriateness and clarity.
- 5) Both versions were sent to a panel of reviewers, along with a brief description of the study topic and design, to be assessed in terms of appropriateness, interpretation and intactness of measurement properties. The members of the panel were bilingual with expertise in the principles of questionnaire design and translation, and healthcare provision (Harkness 2003, WHO 2011) to improve the authenticity and content validity of the Arabic version (Bannigan & Watson, 2009).

- 6) Backward translation was conducted by a native Arabic-speaking academic from a UK university who had not participated in the initial translation process; the two versions were conceptually equivalent as assessed by the lead author who is fluent in both Arabic and English.
- 7) A pilot study was conducted with 10 nurses from a variety of clinical areas using a test-retest technique to measure the reliability of the Arabic version. Participants provided comments on the clarity of purpose, logic, and suitability of vocabulary of the instrument. The time interval between the test and retest was one week. Pearson's product-moment correlation coefficient was 0.95 indicating the stability of the Arabic version over time.
- 8) The initial group reviewed the comments provided in the pilot study participants and agreed that no change to the questionnaire was required.

Thereafter, the survey instrument was distributed separately to the samples in both settings by the first author several months apart. The first author returned to the settings to collect completed questionnaires.

Ethical considerations

Ethical approval was obtained from three ethical committees before the study commenced. The ethical committee of King Fahad Medical City and the Saudi Ministry of Health ethical committee where the study took place, as well as from the ethical committees of the Ministry of Health, Saudi Arabia (ERRC No. 11 099; IRB No.11 049; 16/09/11). By returning the completed questionnaires, participants were assumed to have provided their consent as explained to them in the information sheet for the study.

Data analysis

A range of statistical packages was used to analyze the data, including SPSS version 19.0, which was used to calculate Pearson's r , Chronbach's alpha and for descriptive statistics and the exploratory factor analysis. Within SPSS, the structural equation modeling package AMOS was used to conduct the confirmatory factor analysis. To aid in the decision-making process about the number of factors to be extracted, Monte Carlo Parallel analysis was conducted using public domain software (<http://www.softpedia.com/get/Others/Home-Education/Monte-Carlo-PCA-for-Parallel-Analysis.shtml>; retrieved 18 November 2008), and the congruence analysis was conducted using software obtained from Professor John Crawford (Department of Psychology, University of Aberdeen, Scotland). The Mokken Scaling Analysis procedure for Windows version 5.0 was used for Mokken scaling, and invariant item ordering was investigated using the Mokken package in the public domain software R. To calculate Chi-square across the two samples, MedCalc (www.medcalc.org) software was used.

Exploratory Factor Analysis

We used EFA to investigate the underlying factor structure of the instrument. As noted above, previous studies of the English-language version have variously suggested a single factor, a two-factor structure, and a three-factor structure. Using a sample of native Arabic-speaking nurses, we sought, in this study, to establish whether the structure of the Arabic version of the OCQ was consistent with previous research, particularly, with the work of Angle and Perry (1981) who suggested a two-factor structure based upon "value commitment" and "commitment to stay".

Factor analysis reduces a large number of variables to a few underlying dimensions (Watson & Thompson 2006) and develop a parsimonious analysis and interpretation of data. McDowell and Newell (1996) have suggested three main guidelines in the performance of factor analysis: 1) items are measured at the interval-scale level; 2) data should be nearly normally distributed; 3) the sample to variable ratio should be at least five.

Principal Components Analysis

Whilst not, strictly speaking, factor analysis, a commonly applied method which yields similar results, namely principal components analysis, was used (Watson & Thompson 2006). The number of factors for rotation was determined based on the pilot sample using a combination of Eigenvalues >1 ; inspecting the scree slope of the initial solution, and the application of the Monte Carlo Parallel analysis. Two factors were extracted, after which the extracted factor matrices were inspected for cross-loading and the removal of item 15 and repetition of the factor rotation. The data were suitable for factor analysis on the basis of the Kaiser-Meyer-Olkin, which was 0.91 and 0.87 for samples 1 and 2 respectively, and for both samples the Bartlett's test of sphericity was $p < 0.001$.

Congruence Analysis

The factor solutions obtained from the two extractions were compared for Wrigley and Neuhaus's (1955) coefficients of congruence.

Confirmatory Factor Analysis

CFA was conducted using AMOS software based on the outcome of the principal components analysis. A second-order model was constructed with two first-order factors related directly to the variables in the OCQ with a second-order factor to capture the

shared variance between the first-order factors. Our procedure allowed for testing the fit of an unrestrained model followed by restrictions based on large correlations between error variances detected by large modification indices related to specific pairs of variables (Byrne 2001).

Mokken Scaling

Mokken scaling is used to analyze multivariate data for hierarchical scales (Watson et al. 2011). It is related to item response theory and selects sets of items based on the reproducibility of the ordering of the items, which is measured by Loevinger's coefficient (H); values $> .30$ are considered acceptable (but weak), with values $> .40$ and $.50$, respectively, indicating moderate and strong Mokken scales. Scales should be reliable and values of a single sample test-retest coefficient (Rho) $> .70$ are considered to indicate a reliable scale. Scales should also be statistically significant, following Bonferroni correction for the multiple iterations involved in the procedure, and should show invariant item ordering (IIO) whereby the ordering of individuals by the mean score on the scale is the same as the order in which respondents endorse items on the scale. IIO is measured by a coefficient H_{trans} (denoted H^T) with the strength of the IIO being weak, moderate and strong and $> .30$, $.40$ and $> .50$, respectively.

Discussion

Limitations

It is not possible to rule out an inevitable and unaccountable self-selection bias in the data.

Results

The demographic data are shown in Table S1. The total sample recruited was 412 (sample 1 n = 193; 96% response rate and sample 2 n= 219; 84% response rate). The two samples were substantially and statistically significantly different on all parameters except “Position” (i.e. whether participants were “staff” or “nursing managers”). Sample 1 was more predominantly Saudi than sample 2, which had a younger age distribution. Sample 2 was more predominantly female than sample 1. In terms of educational qualifications, nearly half of respondents were educated to diploma level; a smaller number were educated to associate degree level, a smaller number again had bachelor’s degrees, and the smallest proportion held master’s degrees. In contrast, fewer participants in sample 2 held a diploma, associate degree or master’s degree than participants in sample 1; however, a higher proportion held a bachelor’s degree. The differences in educational attainment between the two samples may be due to the different age profile of the respondents in each sample, and might reflect the increasing tendency for nurses to be educated to Bachelor’s level, particularly among non-Saudi nationals.

The results of the principal components analysis are shown in Table 1. The communalities support the sufficiency of shared variance in the samples and, from the first principal unrotated components, the existence of a general factor of organizational commitment in both samples. The two factor solutions in both samples are identical in terms of the factors that were identified by the loadings on the putative factors. The percentage of variance explained by the two factors was 57.5% and 53.5%, respectively in sample 1 and sample 2. Factor 1, labelled “Value commitment” was composed of items 1, 2, 4, 5, 6, 8 and 10, and was exemplified by items such as “I talk up this organization to my friends as a great organization to work for” and “I am proud to tell others that I am part of this organization”. Factor 2, labelled “Commitment to stay” was composed of the remaining items and was exemplified by items

such as “I could just as well be working for a different organization as long as the type of work were similar” and “It would take very little change in my present circumstances to cause me to leave this organization”. Congruence analysis supported the similarity between Factor 1 in both samples with a congruence coefficient of 0.90; the congruence coefficient for Factor 2 was 0.78. Cronbach’s alpha range between 0.69 to 0.91 for the two factors in both samples.

The second order structural equation model for CFA of the two-factor solution with a general factor of “Organizational commitment” is shown in Figure 1. The model was set up to reflect the same pattern of loadings of items on factors as shown in Table 1. Only part of the outcome of the CFA is shown in Figure 1, the remainder is shown in Tables S2, S3 and S4. Inspection of the modification indices suggested intercorrelation of some error variances and this is shown in Table S2. Table S3 shows the loading of items on the first order factors, which supports the hypothesized model; high loadings on putative factors are hypothesized in CFA with zero loadings on non-putative factors and this very demanding aspect of CFA is upheld. Furthermore, there was no indication of cross-loading of items in the modification indices therefore no relaxation, in terms of intercorrelation between variables, was required. The fit indices, RMSEA and Chi-square are shown in Table S4. After restricting the model, the fit indices shown were acceptably high (<0.9) with the gain in restricting the model shown by showing unrestricted values in brackets. The RMSEA (ideally < 0.06) shows better than mediocre fit of the data to the model. Likewise, the Chi-square value is acceptable: despite being high and statistically significant it is only approximately twice the size of the degree of freedom.

Table 2 shows the result of the Mokken scaling procedure. Nine items were extracted into a scale running, in terms of the mean values of the items, from “being willing to put in a great deal of effort to help the organization be successful” (item 1; mean=6.09) to

“being willing to do almost anything to keep your job” (item 4; mean 4.69). The higher the mean score on an item, the more readily it is endorsed by participants.

Conclusion and recommendations

This study shows that the Arabic version of the OCQ retained the established two-factor structure of the original English-language version. Although the two factors – “value commitment” and “commitment to stay” – repudiate the original developers’ single factor claim (Mowday et al., 1997), results of the current study are congruent with more recent studies that have found the English-language version of the OCQ to be a multidimensional measure (Angle & Perry 1981, Koh et al.1995). The present study also confirms the reliability of OCQ across cultures: Cronbach’s α coefficient ranges indicate that the Arabic version of OCQ has a good internal consistency.

The outcome of Mokken scaling provides a single scale composed entirely of items that load on Factor 1, the “Value commitment” factor. The ordering of items is sensible and shows a hierarchy of value commitment from “being willing to put in the effort to help your organization succeed”, which is the most easily endorsed concept (i.e. least “difficult” in item response theory terms), through a range of concepts related to value commitment, such as being “pleased and proud to work for your organization” (less readily adopted than putting in effort), to “feeling that your values and the organization’s are congruent”, to the least endorsed concept of “being willing to do almost anything to remain with the organization”. Thus, value commitment could be described as ordered in a hierarchy of self-sacrifice with the ultimate self-sacrificing actions being the most difficult to endorse. The items here

show IIO but not sufficiently strongly, suggesting that some of the items are, conceptually very close to the latent trait of value commitment, and that there is the need for some further development of the scale, if IIO is considered a desirable property.

This study provides information on the factorial validity of the OCQ and contributes to the debates around EFA versus CFA (Hurley et al. 1997) and the combination of methods based on classical test (from which factor analysis is derived) and item response theories (Watson et al., 2011). In the present study, the well-established and rigorous procedure outlined by Ferguson and Cox (1993) for conducting EFA was followed and, while EFA and CFA were conducted on the same larger sample, the initial EFA combined with the use of congruence analysis, pointed strongly to the existence of a two-factor structure that could be tested using CFA. The strength of the present analysis is further augmented by the congruence between the two samples in terms of the factor structure obtained, despite substantial demographic difference between the samples.

We recommend, given the advantages of the OCQ as a concise, reliable and easy to administer self-report questionnaire, that the Arabic version of OCQ can be an effective assessment tool for Arabic-speaking health-care organizations. Our study findings also support the cross-cultural generalisability of the OCQ to non-Western languages, cultures and populations. This adds further weight to evidence suggesting that Brislin's (1970) back-translation model is an effective method for ensuring conceptual equivalence in the translation of questionnaire instruments. Future research should seek to replicate the present study, but this should not inhibit the use, in the meantime, of the OCQ.

Implications for nursing practice

This study has demonstrated the applicability of the questionnaire to an Arabic-speaking population. Furthermore, it contributes to the debate on the dimensionality of the OCQ by endorsing those researchers who assert that the OCQ has a two-factor structure. Health-care organizations in the Arab world can make use of the OCQ in the knowledge that it has been proven to be an effective and reliable tool for the collection of data on employee commitment. Additional information on the relationship between items has been provided by the application of item response theory.

Implications for nursing policy

This study helps to address current nursing policy in Saudi Arabia and across much of the Arabic speaking Middle East. In several of the oil-rich nations of this region there is a high turnover of nurses and this is due both to the low job satisfaction of the substantial expatriate workforces and the difficulties of attracting nationals, especially women, to work as nurses (Aboshaiqah 2016). Instruments adapted to study these national and regional phenomena and implement the policies – such as Saudization – are a necessity.

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References

Aakhtar, S. & Tan, D. 1994. Reassessing and reconceptualizing the multidimensional nature of organizational commitment. *Psychological Reports*, 75: 1379-1390.

Aboshaiqah, A. (2016) Strategies to address the nursing shortage in Saudi Arabia. *International Nursing Review* 63, 499–506.

Alghamdi, M. G., Topp, R. and AlYami, M. S. (2017) The Effect of Gender on Transformational Leadership and Job Satisfaction among Saudi Nurses. *Journal of Advanced Nursing* doi:10.1111/jan.13385

Alghamdi M.G. & Urden L.D. (2016) Transforming the nursing profession in Saudi Arabia *Journal of Nursing Management* 24, E95–E100

Alotaibi J., Paliadelis P.S. & Valenzuela F.-R. (2016) Factors that affect the job satisfaction of Saudi Arabian nurses *Journal of Nursing Management* 24, 275–282.

Al-Kahtani, N. 2012. An exploratory study of organizational commitment, demographic variables and job and work related variables among employees in Kingdom of Saudi Arabia. *Online International Interdisciplinary Research Journal*, II: 1-13.

Al-Muhtaseb, H. & Mellish, C. 2008. *Some differences between Arabic and English: A step towards an Arabic upper model* [Online]. Dammam: King Fahd University of Petroleum and Minerals. Available:

<http://faculty.kfupm.edu.sa/ics/muhtaseb/Research/UKPAPER.pdf> [Accessed 7 February 2011].

Alyami (2013) *Leadership style and organizational commitment among nursing staff in Saudi Arabia*, PhD thesis, University of Sheffield.

Angle, H. & Perry, J. 1981. An empirical assessment of organizational commitment and organizational effectiveness.

Administrative Science Quarterly, 26: 1-14.

Bass, B. M. (1985) *Leadership and performance beyond expectations*, Free Press New York.

Bannigan, K. & Watson, R. 2009. Reliability and validity in a nutshell. *Journal of Clinical Nursing*, 18: 3237-3243.

Bozeman, D. P. & Perrewe, P. L. 2001. The effects of item content overlap on Organizational Commitment Questionnaire-turnover cognitions relationships. *Journal of Applied Psychology*, 86: 161–173.

Brislin, R. 1970. Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1: 185-216

Byrne, B.M. 2001. *Structural equation modelling with AMOS: Basic concepts, applications, and programming* (2nd ed.) London: Lawrence Erlbaum.

Cha, E., Kim, K. & Erlen, J. 2007. Translation of scales in cross-cultural research: Issues and techniques. *Journal of Advanced Nursing*, 58: 386-395.

Collini S.A., Guidroz A.M. & Perez L.M. (2015) urnover in health care: the mediating effects of employee engagement. *Journal of Nursing Management* 23, 169–178. T

Commeiras, N. & Fournier, C. 2001. Critical evaluation of Porter et al.'s organizational commitment questionnaire: Implications for researchers. *The Journal of Personal Selling and Sales Management*, 21: 239-245.

Dale, K. 2008. Leadership style and organizational commitment: mediating effect of role stress. *Journal of Managerial Issues*, 20: 109-130.

Ferguson, E. & Cox, T. 1993. Exploratory factor analysis: A user's guide. *International Journal of Selection and Assessment*, 1: 84-94.

Fields, D. 2002. *Taking the measure of work : A guide to validated scales for organizational research and diagnosis*, Thousand Oaks, CA, Sage Publications

Han, S., Moon, S. & Yun, E. 2009. Empowerment, job satisfaction, and organizational commitment: Comparison of permanent and temporary nurses in Korea. *Applied Nursing Research*, 22: 15-20.

Harkness, J. 2003. Questionnaire Translation. In J. Harkness, F. Vijver & P. Mohler (Eds.) *Cross-cultural survey methods*. New Jersey: John Wiley & Sons.

Holtom, B. C. & O'Neill, B. S. 2004. Job embeddedness: A theoretical foundation for developing a comprehensive nurse retention plan. *Journal of Nursing Administration*, 34: 216-227.

Hurley, A.E., Scandura, T.A., Schriesheim, C.A., Brannick, M.T., Seers, A., Vandenberg, R.J., Williams, L.J., 1997. Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of Organizational Behavior*, 18: 667-683.

Ibrahima, N. & Rueb, L. 1994. Organizational commitment: Are there differences between American and Egyptian employees of U.S. multinational corporations in Egypt? *Journal of Transnational Management Development* , 1: 23-34.

Koh, W. L., Steers, R. M. & Terborg, J. R. 1995. The effects of transformational leadership on teacher attitudes and student performance in Singapore. *Journal of Organizational Behavior*, 16: 319–333.

Kuokkanen, L., Leino-Kilpi, H. & Katajisto, J. 2003. Nurse empowerment, job-related satisfaction, and organizational commitment. *Journal of Nursing Care Quality*, 18: 184–192.

Loke, J. 2001. Leadership behaviours: Effects on job satisfaction, productivity and organizational commitment. *Journal of Nursing Management*, 9: 191-204.

Lu, H., While, A. & Barriball, K. 2007. A model of job satisfaction of nurses: A reflection of nurses' working lives in mainland China. *Journal of Advanced Nursing*, 58: 468–479.

Lynn, M. R. & Redman, R. W. 2005. Influences on staff nurses' intention to leave their positions or nursing. *The Journal of Nursing Administration*, 35: 264–270.

McDowell, I. & Newell, C. 1996. Measuring health: A guide to rating scales and questionnaires (2nd ed.) New York: Oxford University Press .

Manion, J. 2004. Strengthening organizational commitment : Understanding the concept as a basis for creating effective workforce retention strategies. *Health Care Manager*, 23: 167-76.

Mowday, R. T., Steers, R. M. & Porter, L. W. 1979. The measurement of organizational commitment. *Journal of Vocational Behavior*, 14: 224-247.

Porter, L. W., Steers, R. M., Mowday, R. T. & Boulian, P. V. 1974. Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology*, 59: 603-609.

Tett, R. P. & Meyer, J. P. 1993. Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology*, 46: 259-293.

Wagner, C. 2007. Organizational commitment as a predictor variable in nursing turnover research: literature review. *Journal of Advanced Nursing*, 60: 13.

Watson, R. & Thompson, D. 2006. Use of factor analysis in Journal of Advanced Nursing: literature review. *Journal of Advanced Nursing* 55: 330–341.

Watson, R., van der Ark, L.A., Lin, L-C., Fieo, R., Deary, I.J., Meijer, R.R. 2011. Item response theory: How Mokken scaling can be used in clinical practice. *Journal of Clinical Nursing* (doi: 10.1111/j.1365-2702.2011.03892.x)

WHO. 2011. *Process of Translation and Adaptation* [Online]. Geneva. Available:

http://www.who.int/substance_abuse/research_tools/translation/en/index.html. [Accessed 07 Feb 2011].

Wrigley, C. S. & Neuhaus, J. O. 1955. The matching of two sets of factors. *American Psychologist*, 10: 418–419.

TABLE 1

PRINCIPAL COMPONENTS ANALYSIS OF THE OCQ ON TWO INDEPENDENT SAMPLES

OCQ items		Sample 1				Sample 2			
				Factors				Factors	
No	Item	Comm	FPUC	1	2	Comm	FPUC	1	2
1	I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.	.47	.65	.67	-.13	.51	.70	.71	.09
2	I talk up this organization to my friends as a great organization to work for.	.60	.77	.75	-.23	.61	.77	.77	.14
3	I feel very little loyalty to this organization.	.42	-.28	.03	.65	.47	.55	.34	.57
4	I would accept almost any type of job assignment in order to keep working for this organization.	.42	.60	.64	-.09	.18	.35	.40	-.11
5	I find that my values and the organization's values are very similar.	.61	.76	.77	-.21	.75	.74	.79	.00
6	I am proud to tell others that I am part of this organization.	.75	.84	.84	-.21	.50	.85	.86	.11

7	I could just as well be working for a different organization as long as the type of work were similar.	.51	-.60	-.35	.62	.71	.20	-.04	.71
8	This organization really inspires the very best in me in the way of job performance.	.68	.82	.76	-.33	.54	.82	.84	.09
9	It would take very little change in my present circumstances to cause me to leave this organization.	.65	-.49	-.13	.79	.61	.02	-.23	.70
10	I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.	.67	.80	.79	-.22	.59	.78	.76	.18
11	There's not too much to be gained by sticking with this organization indefinitely.	.58	-.67	-.41	.63	.34	.46	.23	.73
12	Often, I find it difficult to agree with this organization's policies on important matters relating to its employees.	.50	-.56	-.29	.64	.47	.42	.26	.52
13	I really care about the fate of this organization.	.60	.73	.76	-.12	.50	.68	.62	.29
14	For me this is the best of all possible organizations for which to work.	.58	.75	.73	-.23	.56	.75	.71	.23
Cronbach's alpha				.91	.75			.89	.69

Comm=communality; FPUC=first principal unrotated component; putative loadings on factors are shown in bold

TABLE 2
MOKKEN SCALING OF THE OCQ COMBINED SAMPLES (N=412)

Item	Label	Mean Score	Item H	Items showing HIO
4	I would accept almost any type of job in order to keep working for this organisation.	4.69	0.37	✓
5	I find that my values and the organization's values are very similar.	4.93	0.57	
8	This organistaion really inspires the very best in me in the way of job performance.	5.04	0.60	
14	For me this is the best of all possible organizations to work for.	5.23	0.54	✓
2	I talk up this organisation to my friends as a great organistion to work for.	5.34	0.57	✓
10	I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.	5.35	0.57	✓

6	I am proud to tell others that I am part of this organisation	5.65	0.63	✓
13	I really care about the fate of this organisation.	5.73	0.50	
1	I am willing to put in a great deal of effort beyond that normally expected in order to help this organisation be successful.	6.09	0.52	✓

$H=0.54$; $Rho=0.91$; $p=0.00035$; $H^T=0.26$